

## Guidance for the Preparation of Drinking Water Project Engineering Feasibility Reports

This guidance was prepared to assist applicants in providing engineering data needed in support of the **financial assistance application** to the Texas Water Development Board for all drinking water supply projects except for Economically Distressed Areas Program (EDAP) projects. EDAP applicants must follow directives from the EDAP Facility Engineering Plan/Scope of Services.

- Applicants under the Pre-design Funding (PDF) option are required to submit a **Preliminary Engineering Feasibility Report (PEFR)** as detailed in D1 of the financial assistance application (see TWDB on-line financial assistance application TWDB-0148, [http://www.twdb.state.tx.us/assistance/financial/fin\\_assistance/](http://www.twdb.state.tx.us/assistance/financial/fin_assistance/)). During the planning phase of the project these applicants must provide the material in this guidance, or a report that contains similar details. Note: applicants that have already completed detailed planning can submit a complete DW-002 with the application in lieu of a PEFR.
- Applications not proceeding under the PDF option must provide the material in this guidance, or a report that contains similar details as part of the application.
- Sections II (facilities purchase) and III (reservoirs) may be required as part of the application where applicable.

This guidance is consistent with the following Texas Administrative Code (TAC) rules:

- ◆ 31 TAC 371 of the Texas Water Development Board's (TWDB) Drinking Water State Revolving Fund Rules
  - Chapter 371.13 – Pre-Design Funding Option
  - Chapter 371.60 – Engineering Feasibility Report
- ◆ 31 TAC 363 TWDB's Financial Assistance Program
  - Chapter 363.13 – Preliminary Engineering Feasibility Data
  - Chapter 363.16 – Pre-design Funding Option of the Board rules
- ◆ 31 TAC 384 TWDB's Rural Water Assistance Fund
  - Chapter 384.23 – Pre-design Funding Option
- ◆ The guidance also reflects requirements of 30 TAC 290, Rules and Regulations for Public Drinking Water.

To obtain information on these or any other rules see the TAC rules on line at:  
<http://www.sos.state.tx.us/tac/index.shtml> Open the link, "View the current TAC".

Use of this guidance will assist applicants to address all relevant issues concerning the planning of all projects, except EDAP projects, in the planning period. However, TWDB approval does not negate the need for permits required by the TCEQ or any other agencies. The Engineering Feasibility Report shall bear the signed and dated seal of the registered professional engineer responsible for the design.

Please submit 4 copies of the Engineering Feasibility Report with the application for financial assistance.

# Table of Contents

<b>I. ENGINEERING FEASIBILITY REPORT .....</b>	<b>3</b>
(A) Description of the Existing System Along with Problem(s).....	3
(B) Projected Needs .....	3
(C) Demands .....	3
(D) Alternatives.....	3
(F) New Sources.....	4
(G) Site .....	4
(H) Treatment .....	4
(I) Design Data.....	4
(J) Adequacy .....	4
(K) Operations and Maintenance .....	4
(L) Schedule.....	5
(M) Permits Approvals, and Contracts .....	5
(N) Additional Information.....	5
(O) Project Budget.....	5
<b>II. PURCHASES OF FACILITIES .....</b>	<b>5</b>
<b>III. WATER SUPPLY RESERVOIR PROJECTS.....</b>	<b>5</b>
<b>IV. COST OF THE PROJECT .....</b>	<b>7</b>

## **I. Engineering Feasibility Report**

Smaller systems proposing substantial improvements to a system should address all of the outlined issues below as applicable. Larger utilities addressing a particular portion of the system should include enough information to provide a detailed description of the need for the improvements and proposed solutions within the context of the larger system. The EFR should address the following issues:

### **(A) Description of the Existing System Along with Problem(s)**

- a. Description of existing water supply facilities with information on type of treatment, capacity of facilities and adequacy with regard to water delivery and system pressure.
- b. Existing water source(s), with quantity and quality of water available.
- c. Distribution System – discuss the condition of the distribution system, age, pressures, leakage. If water losses in the system exceed 20%, explain specifically what the community is doing to address the issue. Explain how the project addresses water loss.
- d. A discussion of any operational problems, at the water supply, treatment, or within the transmission and distribution system.
- e. A discussion of any applicable EPA or TCEQ enforcement actions.
- f. Discussion of any violations of primary or secondary drinking water standards along with physical deficiencies of the system.
- g. Maps – provide adequate maps to locate existing facilities and service areas.

### **(B) Projected Needs – Present and future areas to be served, with population data and water demands.**

- a. The domestic population of the area to be served (present through 20-year projection) and the design population of the project.
- b. Industrial, commercial and other water needs must be reflected in the projections (describe the method).
- c. Projections should describe existing service area, expanded service area for the future as well as any community to receive service from the system by contract or consolidation. Note: DWSRF projects cannot be primarily to fund growth for a community.
- d. Planning Horizon – The plan should describe and justify the chosen planning horizon. Typically communities plan for the 20-year needs (or match the term of the funding). Major line work can at times require greater planning horizons. High growth areas can at times require phasing of facilities to fit five or ten-year needs.
- e. Describe current per capita water use along with projected water use/needs.
- f. Historical trends in population and water use may be helpful to explain needs.
- g. TWDB projections – projections should agree with TWDB water plan projections. Where local data is different, provide an explanation of procedures, methodologies and underlying assumptions employed in the formulation for those estimates.

### **(C) Demands – Present and estimated future maximum and minimum water quantity demands. This should include the maximum daily needs along with average annual needs.**

### **(D) Alternatives – Provide a description of the alternatives considered and reasons for the selection of the project proposed. In some cases the available alternatives are few. Where**

major new systems are proposed, a present worth cost analysis may be warranted or required.

**(E) Where a number of alternatives exist:**

- a. The selection of a system must be fully described and reasons for the selection clearly outlined. The selection process should include evaluation of appropriate technologies and full consideration if their costs for the specific project and the environmental compatibility of the project. See Instruction for Preparing an Environmental Information Document SRF-099 in the TWDB website, <http://www.twdb.state.tx.us/assistance/financial/resources/index.asp>
- b. A suggested method of outlining alternative project costs is the Present Worth Method. Present worth is the sum which, if invested now at a given interest rate (DWSRF projects utilize EPA's discount rate \*) would provide exactly the funds required to pay for all present and future costs. Total project cost, used to compare alternatives, is the sum of the initial capital cost, plus the present worth of operation, maintenance, and repair (OM&R) costs, minus the present worth of the salvage value at the end of the 20-year planning period. A detailed present worth analysis may be required where the project involves the construction of major new facilities.
- c. State Water Plan – In some instances the projects described in the State Water Plan involved a detailed analysis of alternatives during the creation of the Regional Water Plan. In many of these instances the EFR simply will be a restatement or update of these materials.

**(F) New Sources** – Where future needs exceed existing supplies, describe the source (or sources), with quantity and quality of water available. This should include a discussion of the adequacy of the supply in drought. The supply must agree with the State Water Plan.

**(G) Site** - Description of proposed site and surroundings for the water works facilities.

- a. Provide adequate mapping to describe the locations and layout of proposed facilities.
- b. Detail the location of any existing infrastructure that affects the ability to locate water facilities in the area.
- c. Indicate flood plain location, required buffers and easements.

**(H) Treatment** - Type of treatment, equipment, and capacity of facilities.

**(I) Design Data** - Basic design data, including pumping capacities, water storage and flexibility of system operation under normal and emergency conditions.

**(J) Adequacy** - Adequacy of the facilities with regard to delivery capacity and pressure throughout the system.

**(K) Operations and Maintenance** – Provide a discussion of the affect of the proposed project on the operation and maintenance budget for the owner.

**(L) Schedule** – Provide a project schedule that includes:

- a. loan closing date;
- b. date for completion of environmental review and finding;
- c. date for Start of first construction contract;
- d. date for completion of final construction contract; and
- e. # of construction contracts proposed.

**(M) Permits Approvals, and Contracts** – Discuss the status of any required permits, approvals and/or contract for the project.

**(N) Additional Information** – The applicant is encouraged to attach any additional information that provides essential information shaping the proposed project. Also, the TWDB may request additional information as procedures require.

**(O) Project Budget** - Current estimated cost and allocation of costs to each project element including engineering, legal and other fees.

## **II. Purchases of Facilities**

Additional Engineering Feasibility Report information requested involving purchases of facilities:

1. inventory and current valuation of facilities to be purchased;
2. general description of the capacities and capabilities of the facilities;
3. historical operating and maintenance records;
4. information on 100-year flood plain and development in the project area; and a
5. demonstration that facilities were constructed in a manner consistent with all applicable environmental laws and regulations.

## **III. Water Supply Reservoir Projects**

Requested additional Engineering Feasibility Report Information for water supply reservoir projects:

1. an area map showing estimated acreage to be acquired and proposed take-line'
2. project delineated on a topographic quad sheet with normal, 100-year and maximum probable design water surfaces indicated'
3. proposed conservation, sediment, flood control and other storage capacities with corresponding areas and elevations;
4. yield of the project based on efficiency, economics, environmental concerns, 10- to 30-year needs, and expected firm annual yield as proposed;
5. expected quality of water to be impounded;
6. existing water rights and purposes of use affected by the project;
7. estimated total land acquisition cost including provision for projected appraisal, title search, legal and other associated costs;
8. description of all improvements (including roads, cemeteries, railroads, and public utilities) to be relocated or protected in the project area;
9. letters, agreements, or other evidence from owners and/or responsible entities on improvements to be relocated or protected stating their position on acceptable means for such relocation or protection and the estimated cost'

10. proposed recreational development and management plan, including anticipated buildup in demand, initial facilities to be provided and proposed are to be dedicated to recreational use; and
11. geologic evaluation of the site accompanied by drilling logs showing sufficient details to indicate that a suitable development site has been selected

(\*) Contact your TWDB Review Engineer for the current EPA discount rate to be utilized in a Present Worth Analysis for DWSRF projects

The Project Budget form (TWDB-1201) below is available to complete or download online at:  
<http://www.twdb.state.tx.us/assistance/financial/resources/index.asp>  
(Use Ctrl+F on your keyboard to find TWDB-1201)

#### IV. Cost of the Project (31 TAC 363.13)

1. Provide the total cost for each project or project phase in the following format:

<b>PROJECT BUDGET (TWDB-1201)</b>						
<b>Uses</b>	<b>TWDB Funds Series 1</b>	<b>TWDB Funds Series 2</b>	<b>TWDB Funds Series 3</b>	<b>Total TWDB Cost</b>	<b>Other Funds</b>	<b>Total Cost</b>
<b>Construction</b>						
Construction	\$1,000	\$1,000	\$1,000	\$3,000	\$1,000	\$4,000
<b>Subtotal Construction</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$3,000</b>	<b>\$1,000</b>	<b>\$4,000</b>
<b>Basic Engineering Fees</b>						
Planning +	\$1,000	\$1,000	\$1,000	\$3,000	\$1,000	\$4,000
Design	\$0	\$0	\$0	\$0	\$0	\$0
Construction Engineering	\$0	\$0	\$0	\$0	\$0	\$0
<b>Basic Engineering Other **</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Basic Engineering Fees</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$3,000</b>	<b>\$1,000</b>	<b>\$4,000</b>
<b>Special Services</b>						
Application	\$1,000	\$1,000	\$1,000	\$3,000	\$1,000	\$4,000
Environmental	\$0	\$0	\$0	\$0	\$0	\$0
Water Conservation Plan	\$0	\$0	\$0	\$0	\$0	\$0
I/I Studies/Sewer Evaluation	\$0	\$0	\$0	\$0	\$0	\$0
Surveying	\$0	\$0	\$0	\$0	\$0	\$0
Geotechnical	\$0	\$0	\$0	\$0	\$0	\$0
Testing	\$0	\$0	\$0	\$0	\$0	\$0
Permits	\$0	\$0	\$0	\$0	\$0	\$0
Inspection	\$0	\$0	\$0	\$0	\$0	\$0
O&M Manual	\$0	\$0	\$0	\$0	\$0	\$0
Project Management (by engineer)	\$0	\$0	\$0	\$0	\$0	\$0
Pilot Testing	\$0	\$0	\$0	\$0	\$0	\$0
Water Distribution Modeling	\$0	\$0	\$0	\$0	\$0	\$0
<b>Special Services Other **</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Special Services</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$3,000</b>	<b>\$1,000</b>	<b>\$4,000</b>
<b>Other</b>						
Administration	\$1,000	\$1,000	\$1,000	\$3,000	\$1,000	\$4,000
Land/Easements Acquisition	\$0	\$0	\$0	\$0	\$0	\$0
Water Rights Purchase (If Applicable)	\$1,000	\$1,000	\$1,000	\$3,000	\$1,000	\$4,000
Capacity Buy-In (If Applicable)	\$0	\$0	\$0	\$0	\$0	\$0
Project Legal Expenses	\$0	\$0	\$0	\$0	\$0	\$0
<b>Other **</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Other Services</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$3,000</b>	<b>\$1,000</b>	<b>\$4,000</b>

<b>Fiscal Services</b>						
Financial Advisor	\$1,000	\$1,000	\$1,000	\$3,000	\$1,000	\$4,000
Bond Counsel	\$0	\$0	\$0	\$0	\$0	\$0
Issuance Cost	\$0	\$0	\$0	\$0	\$0	\$0
Bond Insurance/Surety	\$0	\$0	\$0	\$0	\$0	\$0
Fiscal/Legal	\$0	\$0	\$0	\$0	\$0	\$0
Capitalized Interest	\$0	\$0	\$0	\$0	\$0	\$0
Bond Reserve Fund	\$0	\$0	\$0	\$0	\$0	\$0
Loan Origination Fee	\$0	\$0	\$0	\$0	\$0	\$0
<b>Other **</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Fiscal Services</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$1,000</b>	<b>\$3,000</b>	<b>\$1,000</b>	<b>\$4,000</b>
<b>Contingency</b>						
Contingency	\$20	\$20	\$20	\$20	\$20	\$20
<b>Subtotal Contingency</b>	<b>\$20</b>	<b>\$20</b>	<b>\$20</b>	<b>\$20</b>	<b>\$20</b>	<b>\$20</b>
<b>TOTAL COSTS</b>	<b>\$5,020</b>	<b>\$5,020</b>	<b>\$5,020</b>	<b>\$15,020</b>	<b>\$5,020</b>	<b>\$20,020</b>

Other \*\* description must be entered

+ For Planning applications under the **EDAP Program**, please break down Planning costs as follows:

Category A			0
Category B			0
Category C			0
Category D			0
<b>Total Planning Costs</b>	0	0	0

2. Provide a project schedule outlining projected target dates including but not limited to the following:
  - a) submit application for a Board loan commitment,
  - b) submit plans and specifications for TWDB approval,
  - c) advertise for bids on contract(s),
  - d) open bids and contingently execute contract(s), and
  - e) include time, as necessary, for unforeseen delays to obtain easements for land, buffer zones, or right-of-way easements.
3. Provide an estimate of the total cost of the project per connection, including debt retirement and operation and maintenance costs. Include a comparison of existing costs per connection to the projected cost per connection.

If the Environmental Assessment is to be included within the Engineering Feasibility Report, provide the information required in the *Guidelines for the Preparation of Environmental Assessments, ED-001*.

## References

Rules as listed on page 1 of this guidance.

**Guidelines for the Preparation of Environmental Assessments, ED-001.**